

Thank you.....

Before I give my remarks I'd like to acknowledge that both the College of Saint Benedict and Saint John's University occupy the original homeland of the Dakota and Anishinaabe peoples. We honor, respect, and acknowledge the indigenous peoples forcibly removed from this territory, whose connection remains today. St. Benedict's Monastery and St. John's Abbey previously operated boarding schools for Native children. Now, students, faculty, and staff are working to repair relationships with our Native Nation neighbors.

One thing I often tell my students is that the most important thing they can learn is that they don't know anything. There is always more to learn. One way to come to know things is by asking questions. That's what research is- asking questions, looking for evidence, making a conclusion, and asking another question.

My experiences with research started when I was an undergrad Biology major. Doing research to get into med school or grad school wasn't "a thing" then like it is now. I just thought it sounded cool to "work in the lab" and "do research". Also, I had a lot of questions. For the record, I still have a lot of questions. As a student, I was captivated by how precise and systematic the scientific method is-- yet I never considered being a scientist. Since about age 5, I had my sights set on Med School.

Because I wanted to "be cool" and "do research" I asked my intro biology professor if I could join his lab. He's a limnologist and although I wasn't really interested in lakes or ecology, I was interested in the region's history of hazard waste contamination and their effect on health. We talked about my interests and I read some background research. That's when the questions

came. I had so many questions. My advisor helped me develop a research question, hypothesis, and methods to test it.

I worked long hours wading through creeks to collect soil and water samples and learning to extract dioxin (a toxic chemical) from the samples. I sifted through endless hospital records, learned to use mapping software, and tried to identify connections between the extra high rates of heart disease in the region and the toxic chemicals that were still present.

At some point towards the end of my project, I had a very pivotal interaction with my mentor that has stuck with me throughout my career. I remember sitting with him in a meeting. I remember the room, where we were seated, and my excitement. I probably didn't recognize it as "excitement" at the time. I'm sure I just felt nervous and exhausted. I remember explaining something to my mentor and going on and on, talking and asking questions, wheels spinning in my head the whole time. I remember he stopped and sat back in his chair with a small smirk on his face and laughed at me a little. He said to me "Oh, you've got it bad." "What?!" I said. "The research bug", he said, "you've got it". In the moment, I felt sort of proud about that.

That moment gave me the confidence to be someone who asks a lot of questions. It gave me the confidence to update my priors.

"Update your priors". It's a phrase commonly used in statistics where priors are your prior assumptions, knowledge, and beliefs. When we learn new things and find new evidence, we need to update our priors. Every time we update our previous knowledge and assumptions, we generate more certainty and coherence to what we know. Often, this also leads to more questions. This idea is based on Bayes Theorem in which we rationally update our prior beliefs

and uncertainties based on observed evidence. When we ask questions, when we investigate, when we look for evidence, we're learning new things to help us come to a better understanding.

So after my first go at research, I updated my priors. I had a lot of evidence gathered about what I liked to study. I started asking the questions of myself. What am most interested in? How can I run faster (I was a XC runner)? What are my parents going to say when I tell them med school isn't for me? How can I possibly change my mind now, so late in the game? I took a look at my priors about med school and updated them. Trust me when I say, changing my mind was scary.

I always cherished that moment with my advisor because it truly shaped my life. I pursued exercise physiology instead of medical school. It meant I could keep asking and answering my questions about exercise (and as you can imagine I still have a lot of those questions). Thank goodness I updated my priors and changed my mind because I ended up in position to help others ask important questions and develop the tools to answer them.

Early on as a professor, I was helping my first group of seniors run their statistics for their first research projects when I saw it. My student was researching the effects of ice vests and ice slurries on cooling after exercise in the heat. I can't quite describe what it was- maybe a look or an expression when she asked a question? But I was sure. She HAD it. The research bug. She lit up when we talked about her study, she asked important questions. Questions we hadn't even tackled yet in the project. That moment, that look, those questions from a student- I'm not sure there is a more satisfying teaching moment. I'm so grateful for the experiences I had and the people who helped me change my mind because it led me to this work.

During your time here you'll have a lot of opportunities to ask questions and update your priors. The opportunities will come in class, in conversations with your peers, in those exciting discussions with your professors. They'll come in your internships, service learning, or undergraduate research projects. They'll come as you advocate for yourself and others. Grab hold of those chances to ask questions.

So students, my charge to you is this: Be curious. Use the tools you have and the skills you develop here to ask questions and ask a lot of them. Ask them of others, but ask them of yourself, too. Don't be afraid of the really hard questions and don't be afraid to update your priors when you learn something new. Lastly, as any good researcher, you need to disseminate your findings--- widely and proudly. Communicating what we learn, the evidence we observe, is sharing knowledge. It's a way to advocate for and educate others. SO- ask questions, seek evidence, don't be afraid to change your mind. It might be scary, but it might lead you to somewhere beautifully unexpected.